

Quiz Tomorrow (T, 4/29)  
on ch. 14 and little of ch. 15

Test THURSDAY (5/1) on ch. 13,  
14, and 15

Someone draws three cards from a 52-card deck without replacing the cards. Find the following probabilities:

a)  $P(\text{spade, spade, spade}) = \left(\frac{13}{52}\right)\left(\frac{12}{51}\right)\left(\frac{11}{50}\right) = 0.013$

*Ignore face cards for numbers*

b)  $P(\text{even, even, odd}) = \left(\frac{20}{52}\right)\left(\frac{19}{51}\right)\left(\frac{16}{50}\right) = 0.046$

c)  $P(\text{black, black, heart}) = \left(\frac{26}{52}\right)\left(\frac{25}{51}\right)\left(\frac{13}{50}\right) = 0.064$

d)  $P(\text{heart, heart, black}) = \left(\frac{13}{52}\right)\left(\frac{12}{51}\right)\left(\frac{26}{50}\right) = 0.031$

Someone draws three cards from a 52-card deck and replaces the cards after each draw. Find the following probabilities:

a)  $P(\text{spade, spade, spade}) = \left(\frac{13}{52}\right)\left(\frac{13}{52}\right)\left(\frac{13}{52}\right) = 0.016$

b)  $P(\text{even, even, odd})$

$$= \left(\frac{20}{52}\right)\left(\frac{20}{52}\right)\left(\frac{16}{52}\right) = 0.046$$

c)  $P(\text{black, black, heart})$

$$= \left(\frac{26}{52}\right)\left(\frac{26}{52}\right)\left(\frac{13}{52}\right) = 0.063$$

d)  $P(\text{heart, heart, black})$

$$= \left(\frac{13}{52}\right)\left(\frac{13}{52}\right)\left(\frac{26}{52}\right) = 0.031$$

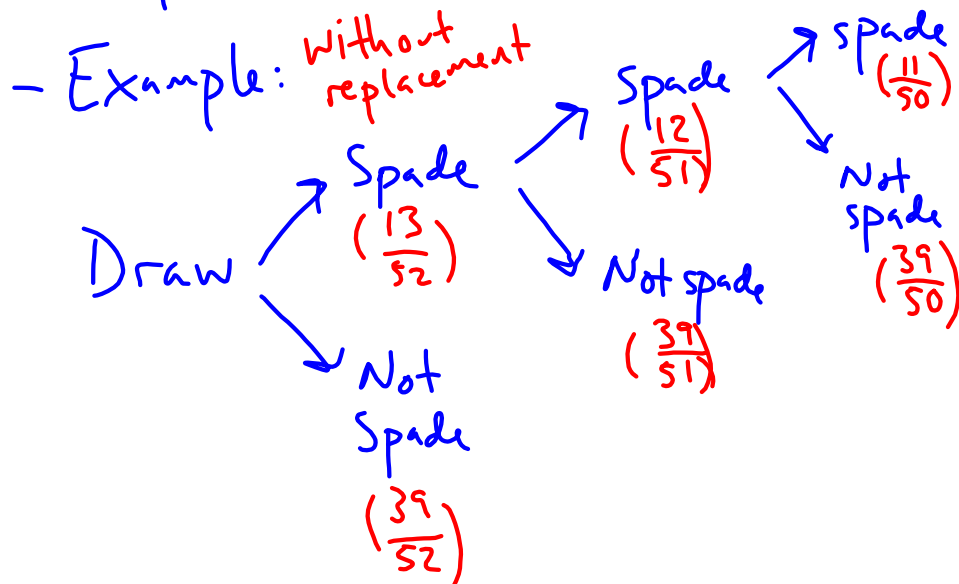
- Summarizing last two pages:
  - Drawing cards without replacement →  
DEPENDENT events
  - Drawing 2 cards together is the same as  
drawing without replacement (DEPENDENT)
  - Drawing cards with replacement →  
INDEPENDENT events

## Probability Rules Continued (Ch.15):

- General Multiplication Rule:
  - Works for compound events that does not require the events to be independent.
  - Equation:  $P(A \cap B) = P(A) \cdot P(B|A)$
  - This is the "drawing without replacement" concept.

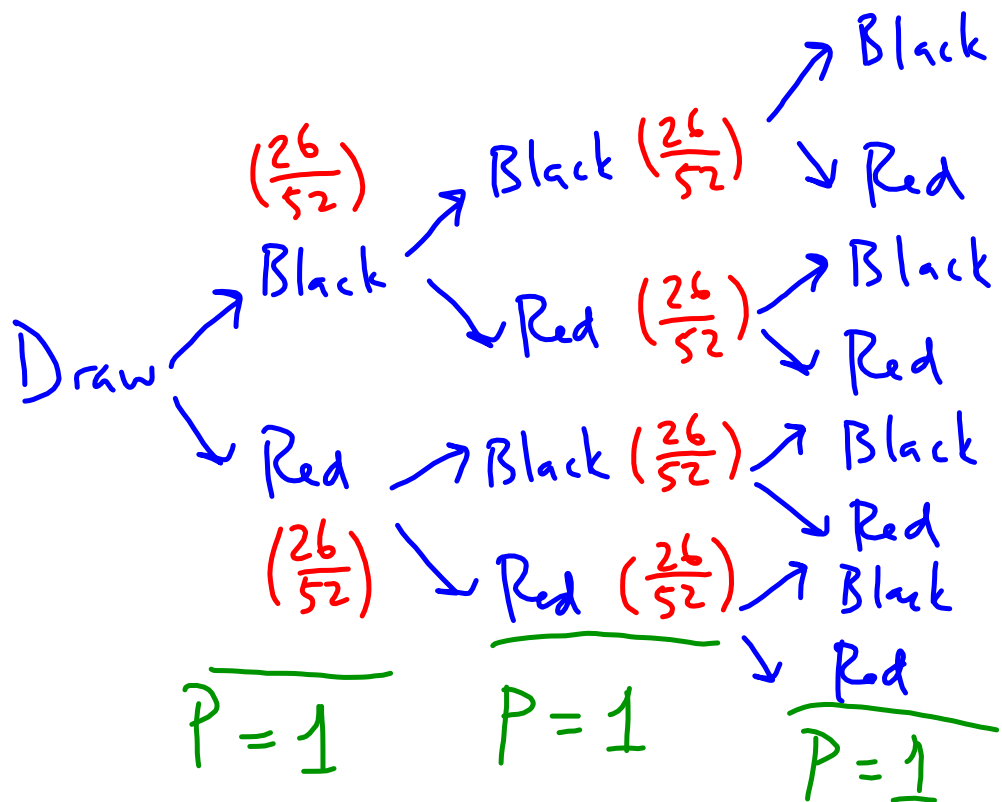
### • Tree Diagrams:

- Shows a sequence of events, giving us a probability that certain path happens



- More examples: pages 332-334

- Another Example: with replacement



- Probability of each branch of tree  
MULTIPLIES together